B1008

Attachment H

COVER SHEET (PAGE 1 of 2)

May 1998 CALFED ECOSYSTEM RESTORATION PROPOSAL SOLICITATION

Proposal Title: Development & Installation of USBR 100cfs Fish Screen
Applicant Name: Greg O'Haver for Reclamation NCAO
Mailing Address: 16349 Shasta Dam Blvd., Shasta Lake, CA 96019-8400
Telephone: (530) 275-1554 (Ext. 213)
Fax: (530) 275-2441

Amount of funding requested: $ 500,000.00 ± for 2 years

Indicate the Topic for which you are applying (check only one box). Note that this is an important decision: see page __ of the Proposal Solicitation Package for more information.

- ☐ Fish Passage Assessment
- ☒ Fish Passage Improvements
- ☐ Floodplain and Habitat Restoration
- ☐ Gravel Restoration
- ☐ Fish Harvest
- ☐ Species Life History Studies
- ☐ Watershed Planning/Implementation
- ☐ Education
- ☐ Fish Screen Evaluations - Alternatives and Biological Priorities

Indicate the geographic area of your proposal (check only one box):

- ☐ Sacramento River Mainstem
- ☐ Sacramento Tributary:_____
- ☐ Delta
- ☐ East Side Delta Tributary: _____
- ☐ Suisun Marsh and Bay
- ☐ San Joaquin Tributary: _____
- ☐ San Joaquin River Mainstem
- ☒ Other: Sac. River, Delta & Tracy Pumping Plant
- ☐ Landscape (entire Bay-Delta watershed)
- ☐ North Bay: _____

Indicate the primary species which the proposal addresses (check no more than two boxes):

- ☐ San Joaquin and East-side Delta tributaries fall-run chinook salmon
- ☒ Winter-run chinook salmon
- ☐ Spring-run chinook salmon
- ☐ Late-fall run chinook salmon
- ☐ Fall-run chinook salmon
- ☒ Delta smelt
- ☐ Longfin smelt
- ☐ Splittail
- ☐ Steelhead trout
- ☐ Green sturgeon
- ☐ Striped bass
- ☐ Migratory birds

May 1998 CALFED ECOSYSTEM RESTORATION PROPOSAL SOLICITATION

Indicate the type of applicant (check only one box):

☐	State agency	☐	Federal agency
☐	Public/Non-profit joint venture	☐	Non-profit
☐	Local government/district	☐	Private party
☐	University	XX	Other: Federal Agency & Water District

Indicate the type of project (check only one box):

☐	Planning	XX	Implementation
☐	Monitoring	☐	Education
☐	Research		

By signing below, the applicant declares the following:

(1) the truthfulness of all representations in their proposal;

(2) the individual signing the form is entitled to submit the application on behalf of the applicant (if applicant is an entity or organization); and

(3) the person submitting the application has read and understood the conflict of interest and confidentiality discussion in the PSP (Section II.K) and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant, to the extent as provided in the Section.

Greg O'Hanen

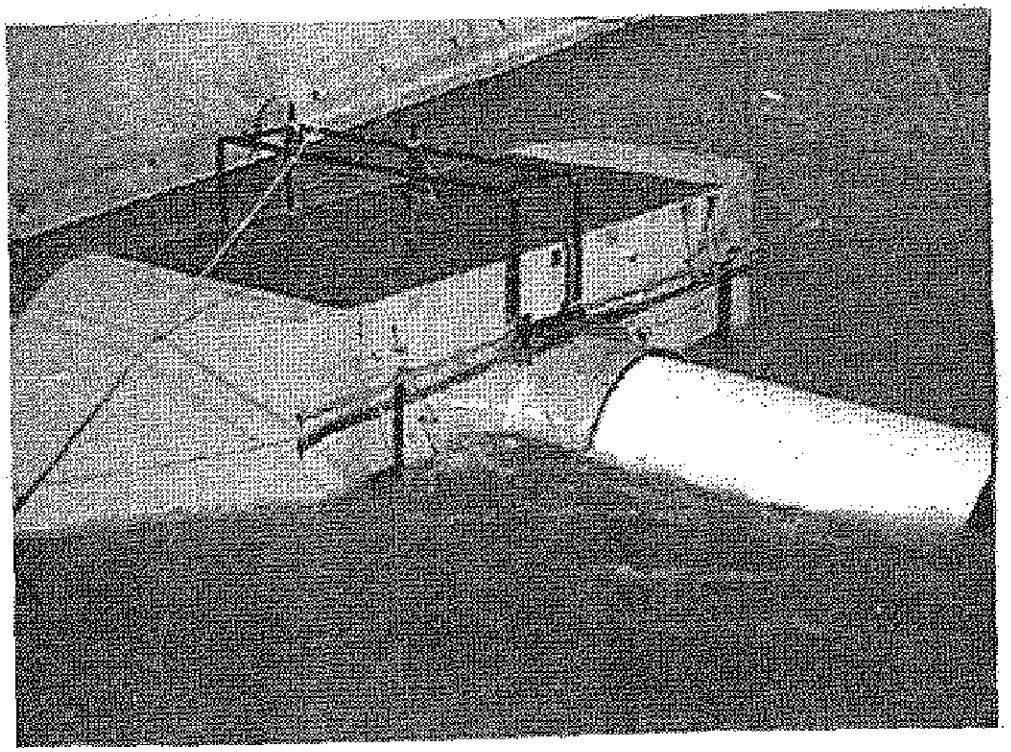
(Signature of Applicant)

B 100B

DEVELOPMENT AND INSTALLATION OF U.S.B.R. 100 CFS FISH SCREEN

PROPOSAL FOR CALFED FUNDING

JULY 2, 1998



Prepared by:
Greg O'Haver and Scott Simmons
For the United States Bureau of Reclamation

Attachment H

COVER SHEET (PAGE 1 of 2)

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- ☐ Species Life History Studies
- ☐ Watershed Planning/Implementation
- ☐ Education
- ☐ Fish Screen Evaluations - Alternatives and Biological Priorities

Indicate the geographic area of your proposal (check only one box):

- ☐ Sacramento River Mainstem
- ☐ Sacramento Tributary: _____
- ☐ Delta
- ☐ East Side Delta Tributary: _____
- ☐ Suisun Marsh and Bay
- ☐ San Joaquin Tributary: _____
- ☐ San Joaquin River Mainstem
- ☒ Other: Sac. River, Delta & Tracy Pumping Plant
- ☐ Landscape (entire Bay-Delta watershed)
- ☐ North Bay: _____

Indicate the primary species which the proposal addresses (check no more than two boxes):

- ☐ San Joaquin and East-side Delta tributaries fall-run chinook salmon
- ☒ Winter-run chinook salmon
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- ☐ Late-fall run chinook salmon
- ☐ Fall-run chinook salmon
- ☒ Delta smelt
- ☐ Longfin smelt
- ☐ Splittail
- ☐ Steelhead trout
- ☐ Green sturgeon
- ☐ Striped bass
- ☐ Migratory birds

DEVELOPMENT & INSTALLATION OF USBR 100 CFS FISH SCREEN

Applicant/Principle Investigator:

Greg O'Haver Professional Mechanical Engineer
(license Calif. 18231)
U.S. Bureau of Reclamation (a Federal Government Agency)
16349 Shasta Dam Blvd.
Shasta Lake City, CA 96019
phone: 530-275-1554
Fax No. 530-275-2441
E-mail: ibr2dm10.ibr2smtp("gohaver@mp.usbr.gov")

Participants/Collaborators in Implementation:

Scott Simmons President of Northwest Associates (a private Corporation)
Manufacturer/Distributor of the USBR Fish Screen
Contractor's license 711536 State of Califorinia Class A
820 Saints Marks
Redding, CA 96003
phone: 530-241-0406
Fax No. 530-246-1409

EXECUTIVE SUMMARY

Project title: Development and Installation of USBR 100 CFS Fish Screen

Project Description and Primary Biological/Ecological Objectives:
To verify, by site demonstration, the performance of the Universal-Stream-Bottom-Retrievable (USBR) Fish Screen (patent 5,558,462) specifically (1) its ability to clean itself of all types of river and delta debris, using its air purge system and (2) its ability to operate in various river conditions without causing harm to any species of fish. Additionally, to develop, install, and test, a 100 CFS version of the already successful 25 CFS prototype of the USBR Fish Screen. The 100 CFS version would be used and tested at the Red Bluff Diversion Dam for screening the water pumped into the Tehama-Colusa Canal (TCC). Upon completion of the testing, the screen and its pumping system could be left in service for when the Red Bluff Dam is seasonally removed for fish passage. The biological objective is to continue to develop a fish screening system which would ultimately facilitate fish passage at major water diversions such as the future Hood Diversion on the Sacramento River, the future Tehama-Colusa Canal diversion required to fill future reservoirs (Sites Reservoir for example), and the future Fish Screening Facility at the Tracy Pumping Plant.

Approach/Tasks/Schedule:
Accomplish the following tasks in the approximate order shown:
(PHASE 1A) Demonstrate the performance of the existing USBR 25 CFS prototype fish screen at the proposed Hood Diversion site on the Sacramento River, using existing Reclamation testing barge, hydraulic pump, and other test equipment. The screens air purge system, retrieval system, and its hydraulics performance will be demonstrated and improved as necessary as they apply to the Hood diversion site. Done in the winter of '98.
(PHASE 1B) Repeat items in PHASE 1A using the Tracy Pumping Plant forebay as the demonstration site. The screen and test laboratory are portable, so the testing can move between the Tracy and Hood sites as appropriate. Done in the fall of '98 and the early summer of '99 when the debris is maximum.
(PHASE 2A) Engineer and fabricate the USBR 100 CFS fish screen prototype. Fabrication will be by Northwest Associates the Company under contract with Reclamation for the exclusive rights to manufacture and distribute the screen. Done in the fall and winter of '98.
(PHASE 2B) Install the USBR 100 CFS fish screen in the Sacramento River, screening the intake to a new turbine or propeller pump to be installed in the Sacramento River downstream of the Red Bluff Pilot Pumping Plant. Done in the spring and summer of '99.
(PHASE 2C) Monitor the performance of the purge system, retrieval system and the hydraulics of the USBR 100 CFS fish screen. Make adjustments and modifications as needed to fully meet the screening requirements of National Marine Fisheries Service (NFMS), Calif. Fish and Game CF&G and all other agencies. Done in the fall and winter of '99.

Justification for the Project and Funding by CALFED:
All three Proposed Alternatives of the "CALFED Ecosystem Restoration Program Plan (ERPP)" of the "Programmatic EIS/EIR" require fish screens on very large diversions. From CALFED "Program Goals and Objectives" of the same EIS/EIR, three Ecosystem Quality Objectives are

(1) to reduce the transport of young fish through the Delta and from north to south across the Delta, (2) to enhance upstream migration of adult salmonids through the Delta, and (3) increase successful out migration of juvenile fish through the Delta (pages A-8 and A-9 of the report). Volume 1 of the ERPP lists water diversions, especially unscreened ones, as major stressors to the ecosystem elements. Volume 2 of the ERPP lists fish screening as a major means of eliminating these stressors.

Budget Costs and Third Party Impacts:
PHASE 1, testing the 25 CFS screen at Hood and at Tracy, will cost $183,300. All testing equipment is already owned by Reclamation, and personnel from Reclamation will direct the demonstration. PHASE 2, fabrication, installation and testing of the 100 CFS screen, will cost $865,100. Approximately half of these costs would need to come from CALFED. All CALFED agencies will be involved in the permitting processes and the monitoring of both phases. The TCCA staff have expressed a willingness to present PHASE 2 participation funding requests to the TCCA Board of Directors for review and consideration..

Applicant Qualification:
Greg O'Haver will direct the projects. He is a registered professional mechanical engineer with a BS degree from UCLA, 30 years experience in the field, 18 at Bureau of Reclamation at Shasta Dam. He is the inventor of the patented USBR fish screen which he has been developing for 6 years. He also designed the Lewiston and Whiskeytown Lake temperature control curtains, and much of the Livingston Stone Fish Facility and many other fish related projects.

Monitoring and Data Evaluation:
Phase 1 demonstration will monitor debris types, their seasonal influx and their distribution over the screen surface, air purge performance, purging intervals, and air burst quantity and flowrates for a given screen area. The evaluations will be site specific and the data will be used to establish purge system geometry and operating criteria for a USBR screen module. The demonstration will also again document how the screen performs under variable river hydraulic and geomorphology conditions. Phase 2 testing of the 100 CFS screen will monitor, in addition to the above, the approach and sweeping velocities at the screen's surface, and will determine all baffle configurations required to obtain a velocity balanced screen which conforms to NMFS criteria.

Local support/Coordination with other Programs/ Compatibility with CALFED objectives:
The TCCA supports the demonstration and testing of the 100 CFS screen, and has shown an initial interest in assisting with the implimentation of its testing. Their water supply would become more dependable, and the impediments to pumping, presently caused by environmental restrictions, would be greatly reduced or removed. Ultimately winter pumping through the TCCA, with the Red Bluff Dam removed (gates up), could provide water to any future water storage sites that might be developed through the CALFED process, IE. Sites Reservoir and others. The USBR fish screening system has been proposed for use at the CALFED proposed future 10,000 CFS Hood diversion on the Sacramento River and could also be used at the 4000+ CFS diversions at Tracy. The 100 CFS USBR screen module, if proven viable and dependable, could be the basic building block for all of these diversions.

PROJECT DESCRIPTION

Scope of Work:

The proposed project consists of two (2) separated phases of work, each totally separate and independent from the other in purpose and funding. Figure 1 shows the concept of the USBR Fish Screen and its design criteria.

PHASE 1 is to verify, by site demonstration, the performance of the 25 CFS model of the Universal-Stream-Bottom-Retrievable (USBR) Fish Screen (patent 5,558,462) specifically (1) its ability to clean itself of all types of river and delta debris, using its air purge system and (2) its ability to operate in various river conditions without causing harm to any species of fish.

PHASE 2 is to develop, install, and test, a 100 CFS version of the already successful 25 CFS prototype of the USBR Fish Screen. The 100 CFS version would be used and tested at or near the Red Bluff Diversion Dam for screening the water pumped into the Tehama-Colusa Canal (TCC).

Each PHASE will consist of tasks as described below:

PHASE 1, TASK A--Demonstrate the performance of the existing USBR 25 CFS prototype fish screen at the proposed Hood Diversion site on the Sacramento River (see Figures 2 &3), using existing Reclamation testing barge, hydraulic pump, and other test equipment. The screens air purge system and its hydraulics performance will be demonstrated and improved as necessary as they apply to the Hood diversion site. Cost is $96,900. Done in the winter of '98.

The USBR Fish Screen was model tested hydraulically in 1994 in the Denver Hydraulic Testing Laboratory of the Bureau of Reclamation. A report titled "Modular Fish Screen Hydraulic Model Study" on that testing is available upon request. A 25 CFS prototype of the USBR Fish Screen was tested for stability, retrievability, hydraulic balance, air purge function, and structural integrity in 1996 and 1997. A report titled "USBR Flat Plate Fish Screen Prototype Testing Program" is also available upon request, contact the applicant. The prototype screen has already been hydraulically balanced for .33 feet per second approach velocity at 22 CFS flow rate. Previous testing did not fully investigate the Screen's cleaning ability using its air purge system at any specific site, nor did it balance approach velocities to .20 feet per second. This task will investigate the ability of the screen to clean itself of site specific debris at the proposed Hood diversion. Additionally, the screens baffles will be adjusted to provide maximum approach velocities of .20 feet per second.

The equipment required to perform the site demonstration and testing will be provided by Reclamation and includes the following:

1. A 12-foot wide by 32-foot long self-propelled barge with 6,000-pound hoist;
2. A 25 cfs diesel, hydraulically-driven water pump with pipeline;
3. A remotely-operated vehicle (ROV) with video camera and recording equipment;
4. Velocity-measuring instruments with on-board data collection computer;
5. An engine-driven 30 CFM air-cooled air compressor with tank;
6. An engine-driven 2,000 watt generator;

7. Tools for any on-board maintenance required;
8. Sanitary facilities;
9. A small self-propelled boat;
10. A fully-functional U.S.B.R. fish screen with discharge piping system, and air purge system.

The details of the testing procedures are as follows:
Screen cleaning effectiveness using back-flushing air from the on-board air compressor, will be tested in two phases. First, the screen's air-burst system will be adjusted, as required, to obtain full coverage of the wedge wire-screen surface. This will be accomplished, primarily, by visual inspection, using the ROV and then by adjusting direction and quantity of air flow by adding and subtracting holes in the air distribution headers. Second, real debris of various varieties, taken from the river environment, will be manually applied or impinged by the pump flows to the screen surface and purged with the system. Effectiveness of the air-burst system will be recorded on video. Operational parameters, such as purge time intervals, air flow quantities, and debris type and concentrations, will be determined and recorded for use in a report to CALFED and for future screen operation manuals.

Velocity distributions, submergence influences on velocity distributions will be investigated using velocity-measuring instruments on the screen face, while flows are being created by the water-pumping system. The prototype is equipped with variable orifice plate structures, which will permit field adjustment to all screen approach velocities, under all river conditions. River conditions and the specific orifice configurations required for those conditions will be recorded and reported to CALFED for possible future screen uses at the Hood river site and others with similar parameters. Controlled fish releases in front of the screen will not be performed. Instead, a NMFS established approach velocity of .20 will be sought by adjusting the screen's baffles. All water discharges from the pumping system will be returned to the river directly without altering its physical qualities in any way. The hydraulic fluid in the pumping system will be non-toxic food grade oil which will not harm living organisms if an accidental spill was to occur.

PHASE I, TASK B--Repeat item PHASE IA, except as noted below, using the Tracy Pumping Plant forebay as the demonstration site. The screen and test laboratory are portable, so the testing can move between the Tracy and Hood sites as appropriate. Cost is $86,400. To be done in the fall of '98 and the early summer of '99 when the debris is maximum.

Primarily, only the debris handling ability of the screen will be demonstrated at Tracy. Questions that must be answered are:
(1) What concentration of debris loading affects the screen's approach velocities to a point which requires air purging?
(2) How often is air purging required to clean the screen of specific types of debris without sweeping flows being present?
(3) Does the debris, once purged, return to the screen, or does it float or settle after purging?
(4) What type of trash removal would be required upstream from the screen to insure its continuous functional operation?

Any fish screening operation at Tracy will require complete trash and debris removal from the

pumped flows, without harming fish. This proposed demonstration will be the first step in determining the type and size of any continuously operating, traveling trash screen that would be required upstream from the USBR fish screen or any other screens.

Deliverables from this demonstration would be a report to CALFED on the types and quantities of debris that would be impinged onto the USBR screen at full pumping rates, and the amount of purging that would be required to clean the screen adequately for its continuous use. Also delivered would be a recommendation, in the form of a report, on the type of pre-screening trash-removal equipment that would be required in front of the USBR screen in order for it, or any other screen, to be viable at Tracy.

The screen approach velocity requirement at Tracy is .33 FPS and the USBR screen has been adjusted and balanced previously in river conditions for that value. The approach velocities may vary somewhat due to the stagnant nature of the test site, therefore, baffle adjustments will be made as necessary to maintain approach velocities below .33 FPS.

The barge is not required at Tracy. All equipment can be conveniently located on the bank of the forebay. Refer to Figure 4 showing the location of the demonstration site and equipment layout.

PHASE 2, TASK A--Engineer and fabricate the USBR 100 CFS fish screen prototype.

Engineering, consisting of design and the preparation of plans and specifications, will be performed by the Northern California Area Office (NCAO) of the Bureau of Reclamation. Greg O'Haver, the screen's inventor, will be the design engineer. The 100 CFS model of the USBR screen will use the same design criteria as was used successfully on the 25 CFS model (IE approach velocity of .33 FPS, interior velocities of 2 FPS maximum etc., see Figure 1). It will be approximately 12 feet wide by 25 feet long, not including nose cones which will add another 25 feet to the overall length of a single module unit. The cost of engineering, including the preparation of drawings and specifications is $20,800. The engineering will be done in November 1998 through January of 1999. Deliverables will be a complete set of drawings and specifications ready for a contract to fabricate.

Fabrication of the 100 CFS model of the USBR screen will be by Northwest Associates, the Company under contract with Reclamation for the exclusive rights to manufacture and distribute the screen. Fabrication will require that prototype molds be made for the 4 major fiberglass components of the screen module, the upper and lower cases, the bottom pan, and the nose cones. The cost of the molds is $280,000. The prototype 100 CFS screen will be fabricated, per the specifications, from fiberglass and stainless steel. The cost of the prototype is $190,000. Northwest has agreed to provide the labor and the materials to fabricate the molds. The $190,000 amount is being sought from CALFED sources. The molds and the first prototype 100 CFS screen will be fabricated from December 1998 to April 1998. Deliverables will be a completely functional screen to be used first for testing and ultimately for the new TCCA pump proposed in Phase 2, TASK B.

PHASE 2, TASK B--Install the USBR 100 CFS fish screen in the Sacramento River, screening

the intake to a new turbine or propeller pump to be installed about 100 feet down-stream from the Red Bluff Diversion Dam Pilot Pumping Plant. This task consists of the following Subtasks:

2B(Subtask 1)--Engineer the pumping station and 100 CFS USBR screen installation. Prepare plans and specifications for the installation.

2B(Subtask 2)--Prepare NEPA AND CEQA documents required to install the demonstration screen and pump at the test site.

2B(Subtask 3)--Obtain all Agency permits required to install and test the installation.

2B(Subtask 4)--Install pump footings and 100 CFS turbine pump.

2B(Subtask 5)--Install 100 CFS pump and intake pipe.

2B(Subtask 6)--Install 48 inch pump discharge pipe and ditch to TC Canal.

2B(Subtask 7)--Install 100 CFS USBR fish screen and equip. into the Sacramento River.

2B(Subtask 8)--Install electrical power and controls for the turbine pump.

The existing Reclamation Pilot Pumping Plant at Red Bluff Dam will be continuing testing of that facility making it necessary to install the USBR screen test site downstream from the Pilot Pumping Plant and clear of that on-going testing project. Any design and installation involving the USBR screen at Red Bluff must be approved by the Bureau of Reclamation, US Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and Calif. Fish and Game (CF&G).

The cost for PHASE 2B is $261,500. The TCCA will be requested to contribute up to $133,800 towards the pump and piping systems, and $84,000 is being sought from CALFED sources. Work will be accomplished in the spring and summer of '99.

PHASE 2, TASK C--Monitor the performance of the purge system, retrieval system and the hydraulics of the USBR 100 CFS fish screen. Make adjustments and modifications as needed to fully meet the screening requirements of National Marine Fisheries Service (NMFS), Calif. Fish and Game CF&G and all other agencies. A complete monitoring plan for the screen testing program will be prepared for CALFED and the agencies and submitted for approval prior to testing. The testing and monitoring is to be accomplished in the fall and winter of '99, and spring of 2000. Estimated cost for PHASE 2C is $100,000.

This task consists of the following Subtasks:

2C (Subtask 1)--Measure and adjust velocity distributions for various submergence depths using velocity-measuring instruments on the screen face, while the turbine pump is being operated. All water discharges from the pumping system will be placed in the TC Canal. The prototype is equipped with variable orifice plate structures, which will permit field adjustment to all approach velocities, under all river conditions. River conditions and the specific orifice configurations required for those conditions will be recorded for future use at specific river sites.

2C (Subtask 2)--Monitor and optimize the screen's air-purge cleaning effectiveness using an air compressor and tank installed on shore. First, the screen's air-purge system will be adjusted, as required, to obtain full coverage of the wedge-wire screen surface. This will be accomplished, primarily, by visual inspection, using the ROV and then by adjusting direction and quantity of air flow by adding and subtracting holes in the air distribution headers. Second, real debris of various varieties, taken from the river environment, will be manually applied to the

screen surface and purged with the system. Effectiveness of the air-purge system will be recorded on video. Operational parameters, such as purge time intervals, air flow quantities, and debris type and concentrations, will be determined and recorded for use in future screen operation manuals.

2C (Subtask 3)--Verify the screen's stability during deployment, retrieval and in operation on the river bottom operation. Investigate foundation scour during floods. Correct any deficiencies encountered. The results of the testing will be recorded on video.

2C (Subtask 4)--Investigate and record predator behavior in the habitat around the screen with the deflection shields installed. These shields greatly reduce vortex flows in the proximity of the screen. Predator behavior will be examined using the ROV.

2C (Subtask 5)--Verify the structural adequacy of the screen structures, at the end of the testing program. The screen is designed to withstand a six-foot head pressure differential between the screen's interior water passages and the surrounding river pressure. Structural integrity testing will be accomplished by static-load tests and impact tests on critical components.

2C (Subtask 6)--The screen's bottom discharge design and the slip-joint coupling that connects the screen to the pipe are all new designs intended for this project and will be examined and tested for leakage, fit and ease of connection (without divers).

Upon completion of the PHASE 2C testing, it is anticipated that the screen and its pumping system would be left in service for use when the Red Bluff Dam is seasonally removed for fish passage.

Benefits:

The biological objective of all PHASES and TASKS listed, is to continue to develop a fish screening system which could ultimately facilitate fish passage at major water diversions such as the future Hood Diversion on the Sacramento River, the future Tehama-Colusa Canal diversion required to fill future reservoirs (Sites Reservoir for example), the future Fish Screening Facility at the Tracy Pumping Plant, and many other sites in California. The development of efficient fish screening systems which meet all agency requirements, is an major implementation objective of CALFED (ERPP Vol. 1 pg. 277).

By developing the 100 CFS USBR Fish Screen module, CALFED projects, could be able to screen fish directly in the rivers (no bypasses), using 100% of the screening surface at all river levels, while maintaining constant, equally distributed approach velocities. The screen system is at least half the cost of any other screening system available today because it can be mass produced and requires very little civil construction to install it. For example, a 2000 CFS pumping station at the TCC headworks at Red Bluff, using standard turbine pumps combined with the USBR screening system, would cost about $12 million, this is less than the cost of screens alone at GCID, and about the same cost as the 350 CFS Contra Costa proposed screens alone. The proposed 10,000 CFS diversion at Hood, using the USBR screening system, would cost about $30 million for the screens installed, including the civil structures, and conveyance conduits, less than half the cost of any other screening systems available. Because the screen is retrievable by floating, completely corrosion resistant, is self flushing, and it has no moving parts to clean it, maintenance costs are kept at absolute minimum.

Justification for the Project and Funding by CALFED:
All three Proposed Alternatives of the "CALFED Ecosystem Restoration Program Plan (ERPP)" of the "Programmatic EIS/EIR" require fish screens on very large diversions. From CALFED "Program Goals and Objectives" of the same EIS/EIR, three Ecosystem Quality Objectives are (1) to reduce the transport of young fish through the Delta and from north to south across the Delta, (2) to enhance upstream migration of adult salmonids through the Delta, and (3) increase successful out-migration of juvenile fish through the Delta (pages A-8 and A-9 of the report). Volume 1 of the ERPP lists water diversions, especially unscreened ones, as major stressors to the ecosystem elements (pages 273 - 277; especially table 13 Pg 273). Volume 2 of the ERPP lists fish screening as a major means of eliminating these stressors (pages 32, 94, 138, 178, 197, 211, 234, 262, 294, 326, 349, 379, 414 and 445).

Although the USBR screen will benefit all species of fish, the winter-run salmon, spring-run salmon, steelhead trout, splittail and delta smelt, and others, are the ESA listed species which provide the greatest impetus for using this economical and efficient screening system. The USBR screen system will prevent entrainment, stranding and misguidance of these fish at nearly all diversions.

Monitoring and Data Evaluation:
An ecological and biological monitoring plan will be submitted by the applicant, and must be approved by all CALFED agencies prior to testing of the USBR screen in all phases or work (see Figure 5). Phase 1 demonstration will monitor debris types, their seasonal influx and their distribution over the screen surface, air purge performance, purging intervals, and air burst quantity and flowrates for a given screen area. The evaluations will be site specific and the data will be used to establish purge system geometry and operating criteria for a USBR screen module. The demonstration will also again document how the screen performs under variable river hydraulic and geomorphology conditions. Phase 2 testing of the 100 CFS screen will monitor, in addition to the above, the approach and sweeping velocities at the screen's surface, and will determine all baffle configurations required to obtain a velocity balanced screen which conforms to NMFS criteria.

Local support/Coordination with other Programs:
The TCCA supports the demonstration and testing of the 100 CFS screen, and has shown an initial interest in assisting with the implimentation of its testing. Their water supply would become more dependable, and the impediments to pumping, presently caused by environmental restrictions, would be greatly reduced or removed. Ultimately winter pumping through the TCCA, with the Red Bluff Dam removed (gates up), could provide water to any future water storage sites that might be developed through the CALFED process, IE. Sites Reservoir and others.

The USBR fish screening system was proposed by the applicant in April 1998, for use at the CALFED proposed future 10,000 CFS Hood diversion on the Sacramento River. The Hood proposal was presented to the CALFED conveyance committee (Joe DeVries, Mark Cowin and others) who suggested that this application for CALFED assistance be submitted. See attached Drawings SH-0001, SH-0002 and SH-0003 for that proposal.

COST AND SCHEDULE TO IMPLEMENT PROPOSED PROJECT

Budget Costs:

A cost breakdown is shown in TABLE 1, a summary of the cost breakdown is shown in TABLE 2.

Phase 1, testing the 25 CFS screen at Hood and at Tracy, will cost and estimated $183,300. Anticipated CALFED funding for Phase 1 is $126,200 and can be funded separately from Phase 2. Because all testing equipment, valued at over $200,000 is already owned by Reclamation for the purpose of testing the USBR screen, and because personnel from Reclamation will direct and manage the demonstrations at no cost to CALFED, the 50% maximum funding requirement by CALFED can be met when the total value of Reclamation's contribution is considered.

Phase 2, fabrication, installation and testing of the 100 CFS screen, will cost $865,100. $347,500 of this amount is anticipated to come from CALFED, and the balance is anticipated to come from Northern Calif. Area Office (NCAO), Northwest Associates (NWA) and Tehama-Colusa Canal Authority (TCCA). The TCCA staff have expressed a willingness to present PHASE 2 participation funding requests to the TCCA Board of Directors for review and consideration. NWA has agreed to commit their labor, materials, profit and overhead up to $280,000 to the Phase 2 construction, and have affixed their signature to this application.

Phase 2A could be funded separately from the other Phases, but a test/demonstration of the 100 CFS screen would be delayed. Funding for Phases 2B and 2C would need to occur, or an alternative test site would need to be obtained, before testing could continue. Phases 2B and 2C would need to be funded together, installing a complete pumping system at Red Bluff without testing the screen would not be acceptable with the Agencies. If funding for Phase 2C was delayed, the pumping system could not be used until Phase 2C was funded.

All CALFED agencies will be involved in the permitting processes and the monitoring of both phases (see Figure 5) and will play a vital role in determining the schedule, especially the start dates. Table 3 shows a proposed schedule for all 5 Phases of work and testing.

TABLE 3
PROPOSED SCHEDULE OF EVENTS

PHASE NUMBER	MONIT-ORING PLAN COMPLETE	PERMITS READY	START DATE	HALF PARTIAL PAYMENT DATE	COMPLE-TION DATE	REPORTS DUE DATE
PHASE 1A	9-15-98	11-1-98	11-1-98	1-1-99	2-28-99	6-1-99
PHASE 1B	1-15-99	3-1-99	3-1-99	5-1-99	6-30-99	10-1-99
PHASE 2A	N/A	N/A	10-1-98	12-15-98	2-28-99	N/A
PHASE 2B	N/A	3-1-99	3-1-99	5-15-99	8-1-99	N/A
PHASE 2C	6-1-99	8-1-99	8-1-99	11-15-99	3-1-2000	7-1-2000

TABLE 1
COST BREAKDOWN TABLE

Project Phase &Task	Direct Salary and Benefit	Overhead Labor (General, Admin. & Fee)	Service Con-tracts	Material & Aquisi-tion Contracts	Misc. & Other Direct Costs	Proposed Source of Funding	Total Cost
P-1A Mobili-zation			3,000			CALFED	3,000
P-1A Screen Mods.			9,000			CALFED	9,000
P-1A Fuel			6,000			CALFED	6,000
P-1A Provide equip.				44,000 * Equivalent Rent Valu		NCAO	
P-1A Labor Screen Mods.			7,200			CALFED	7,200
P-1A Field Labor, Vel. Monitor			25,200			CALFED	25,200
P-1A Labor, Debris Monitor			18,000			CALFED	18,000
P-1A Superv. Engr. & Reports	7,800				Travel 2,500	NCAO	10,300
P-1A Procure-ment *Admin*		2,000				NCAO	2,000
P-1A Field Per Diem			7,200			NWA	7,200
P-1A Contract Profit & Overhd.			9,000			NWA	9,000

I-008384

				$44,000* not actual but equiv. value		**TOTAL PHASE-1A**	**96,900**
Project Phase & Task	**Direct Salary and Benefit**	**Overhead Labor (General, Admin. & Fee)**	**Service Con-tracts**	**Material & Aquisi-tion Contracts**	**Misc. & Other Direct Costs**	**Proposed Source of Funding**	**Total Cost**
P-1B Mobili-zation			2,000			CALFED	2,000
P-1B Pipe Material				3,000		CALFED	3,000
P-1B Pipe Installed			3,600			CALFED	3,600
P-1B Fuel				6,000		CALFED	6,000
P-1B Provide Equip.				35,000 * Equiv. Rent Valu		NCAO	
P-1B Field Labor Velocity Monitor			18,200			CALFED	18,200
P-1B labor Debris Monitor			25,000			CALFED	25,000
P-1B Superv. Engr. & Reports	9,100				Travel 2,500	NCAO	11,600
P-1B Procure-ment Admin.		2,000				NCAO	2,000
P-1B Field Per Diem			7,200			NWA	7,200

P-1B Contract Profit & Overhd.			7,800			NWA	7,800
				$35,000 * not Actual but Equiv. Value		**TOTAL PHASE-1B**	**86,400**
Project Phase & Task	**Direct Salary and Benefit**	**Overhead Labor (General, Admin. & Fee)**	**Service Con-tracts**	**Material & Aquisi-tion Contracts**	**Misc. & Other Direct Costs**	**Proposed Source of Funding**	**Total Cost**
P-2A Fab Mold; lwr case			70,000			NWA	70,000
P-2A Fab. Mold upr case			90,000			NWA	90,000
P-2A Fab Mold nose cones			80,000			NWA	80,000
P-2A Fab Mold bottom pan			40,000			NWA	40,000
P-2A Fab. Lower case			20,000			CALFED	20,000
P-2A Fab. Upper case			30,000			CALFED	30,000
P-2A Fab. Nose cones			30,000			CALFED	30,000
P-2A Fab. Bottom pan			10,000			CALFED	10,000
P-2A Buy screen				20,000		CALFED	20,000

Project Phase & Task	Direct Salary and Benefit	Overhead Labor (General, Admin. & Fee)	Service Con-tracts	Material & Aquisi-tion Contracts	Misc. & Other Direct Costs	Proposed Source of Funding	Total Cost
P-2A Install buoy. system			10,000			CALFED	10,000
P-2A Install purge system			20,000			CALFED	20,000
P-2A Install baffles			10,000			CALFED	10,000
P-2A Final assem.			20,000			CALFED	20,000
P-2A Fab. Dischrg. Connect			5,000			CALFED	5,000
P-2A Fab. Dischrg. Pipe			15,000			CALFED	15,000
P-2A Engin-eering design	5,000					NCAO	5,000
P-2A Plans & specs.	15,800					NCAO	15,800
P-2A Engin-eering inspect.	3,900					NCAO	3,900
P-2A Admin. Procure.		3,600				NCAO	3,600
P-2A Admin. inspect.	4,800					NCAO	4,800
						TOTAL PHASE-2A	**503.1k**

I-008387

Project Phase & Task	Direct Salary and Benefit	Overhead Labor (General, Admin. & Fee)	Service Con-tracts	Material & Aquisi-tion Contracts	Misc. & Other Direct Costs	Proposed Source of Funding	Total Cost
P-2B Fab. & Install river anchors			4,000			CALFED	4,000
P-2B Buy pump				70,000		TCCA TBD	70,000
P-2B Buy pump elect.& controls				10,000		TCCA TBD	10,000
P-2B Install pump elect. & controls			15,000			CALFED	15,000
P-2B Fab. Pump footings			15,000			CALFED	15,000
P-2B Fab. Intake pipe			20,000			CALFED	20,000
P-2B Install pump & pipe			15,000			CALFED	15,000
P-2B Dig dis. ditch			25,000			TCCA TBD	25,000
P-2B Line ditch			20,000			TCCA TBD	20,000
P-2B Buy & install discharg pipe			1,500	2,500		TCCA TBD	4,000
P-2B Install 100CFS screen			2,000			CALFED	2,000
P-2B Buy & install airpurge			5,000	8,000		CALFED	13,000

Project Phase & Task	Direct Salary and Benefit	Overhead Labor (General, Admin. & Fee)	Service Con-tracts	Material & Aquisi-tion Contracts	Misc. & Other Direct Costs	Proposed Source of Funding	Total Cost
P-2B Enginrg design	3,500					NCAO	3,500
P-2B Plans & Specs.	5,200					NCAO	5,200
P-2B Enginrg inspect	5,200					NCAO	5,200
P-2B Admin. Procure		3,300				NCAO	3,300
P-2B Write NEPA docs.		10,400				NCAO	10,400
P-2B Obtain permits		5,200				NCAO	5,200
P-2B Contr. Admin.		4,400				NCAO	4,400
P-2B TCCA admin.		4,800				TCCA	4,800
P-2B Agency fees		6,500				OTHERS	6,500
						TOTAL PHASE-2B	**261.5k**

I-008389

Project Phase & Task	Direct Salary and Benefit	Overhead Labor (General, Admin. & Fee)	Service Con-tracts	Material & Aquisi-tion Contracts	Misc. & Other Direct Costs	Proposed Source of Funding	Total Cost
P-2C mobili-zation			1,500			CALFED	1,500
P-2C Velocity adjust			15,000			CALFED	15,000
P-2C Velocity monitor			10,000			CALFED	10,000
P-2C air purge adjust			12,000			CALFED	12,000
P-2C air purge monitor			11,500			CALFED	11,500
P-2C stability testing			4,000			CALFED	4,000
P-2C stability modifs.			6,000			CALFED	6,000
P-2C predator monitor			5,000			CALFED	5,000
P-2C struct. analysis			4,500			CALFED	4,500
P-2C test bottom discharg			4,000			CALFED	4,000
P-2C Monitor plan	2,900					NCAO	2,900
P-2C Enginrg inspect	5,200					NCAO	5,200
P-2C Reports agencies	5,200					NCAO	5,200
P-2C Admin. Procure		2,200				NCAO	2,200

Project Phase & Task	Direct Salary and Benefit	Overhead Labor (General, Admin. & Fee)	Service Con-tracts	Material & Aquisi-tion Contracts	Misc. & Other Direct Costs	Proposed Source of Funding	Total Cost
P-2C Statemt of work	2,600					NCAO	2,600
P-2C Contract admin.		2,400				NCAO	2,400
P-2C Permits		6,500				NCAO	6,500
						TOTAL PHASE-3C	**100.5k**

TABLE 2
SUMMARY OF COST BREAKDOWN

PHASE NUMBER	NCAO	NWA	TCCA	CALFED	OTHERS	TOTAL BY PHASE
1A	12,300	16,200	----------	68,400	----------	96,900
1B	13,600	15,000	----------	57,800	----------	86,400
2A	33,100	280,000	----------	190,000	----------	503,100
2B	37,200	----------	133,800	84,000	6,500	261,500
2C	27,000	----------	----------	73,500	----------	100,500
SUB-TOTAL	123,200	311,200	133,800	473,700	6,500	
GRAND-TOTAL						**$1,048,400**

APPLICANT QUALIFICATIONS:

Greg O'Haver will be responsible for the design, direction and management of the projects. Address: Bureau of Reclamation, 16349 Shasta Dam Blvd., Shasta Lake City, CA (530) 275-1554, Fax (530) 275-2441.

He is a registered professional mechanical engineer with a BS degree from UCLA, 30 years experience in the field, 18 at Bureau of Reclamation at Shasta Dam as a mechanical engineer performing maintenance, construction and improvement design engineering for 7 dams, 6 powerplants, 1 pumping plant and scores of other civil structures and mechanical equipment. He served 7 years as a consultant with CH2M-Hill in Redding, CA.

He participated in the original concept and value analyis of the Shasta Dam Temperature Control Device and contributed to its mechanical design. He also designed the Lewiston and Whiskeytown Lake temperature control curtains, much of the Livingston Stone Fish Facility and many other fish related projects.

He is the recipient of over 10 Special Service and Star awards during his service with Reclamation. He was nominated for Reclamations Mid-Pacific Region Engineer of the Year Award in 1994. He has received many awards for publications and speaking engagements.

He is the inventor of the patented USBR fish screen which he has been developing for 6 years. The first installation for this screen, the 25 CFS version, will be at the Coleman National Fish Hatchery intake #3 in Battle Creek. Two more installations are pending for agricultural diversions in the Sacramento River near Colusa, CA.

Because of the potential of receiving royalties from the Dept. of Interior for the invention of the USBR fish screen, Greg O'Haver can not be directly responsible for any transfer of funds between himself and Northwest Associates, the Company given the exclusive rights by Interior to manufacture and distribute the USBR screens. He can, however, perform engineering, consultation and inspection duties for Reclamation regarding the screen even to the point of over-seeing and directing the demonstration projects being proposed herein. Fund transfers between CALFED and Northwest Associates must be accomplished by agreements and transfer processes outside of O'Haver's influence or control. This arrangement can be determined by CALFED and procurement personnel within Reclamation.

Greg will write the work plans, monitoring plans, and other reports required for PHASE 1 work.

Greg will being doing the design for the fabrication and the installation of the PHASE 2 screen at the TCC. He will be drawing on Reclamation's pool of engineers at Sacramento, CA and Denver, CO for peer review of all his designs. He will be working closely with Northwest Associates during the development of the molds required to fabricate the 100 CFS screen, and again during the construction of the 100 CFS prototype screen. He will be coordinating all PHASE 2 designs with the TCCA and their board. He will also be responsible for communicating with all the CALFED agencies and in the preparation of all required permits for all PHASES of work.

W.Scott Simmons, Vice President of Northwest Associates, will be responsible for the construction of all molds required to fabricate the 100 CFS prototype screen. These molds, when developed and proven, will eventually become the molds for the production screen. The cost of the molds is being absorbed by Northwest Associates in anticipation of CALFED support for the procurement of the PHASE 2 screen being proposed for the TCCA at Red Bluff.

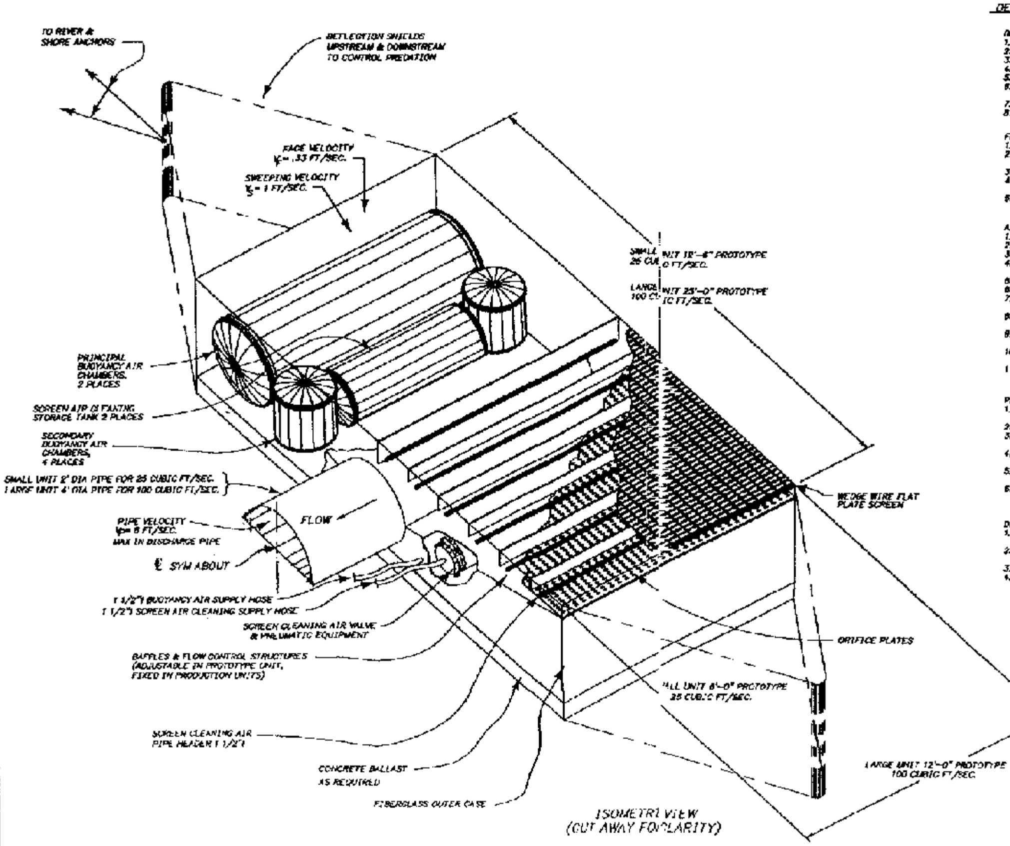
Mr. Simmons will be responsible for providing the labor and materials for performing the PHASE 1 demonstrations at Hood and at Tracy, using the equipment provided by Reclamation. He will also be responsible for the fabrication, installation, and the labor and materials required for monitoring the 100 CFS screen at Red Bluff.

Mr. Simmons is responsible for the planning,procurement and management of field activities. Heholds a General Engineering and Construction License from the California State Contractor's Board. Mr. Simmons has 10 years of experience in water system installation and maintenance, and 13 years of experience in environmental mitigation implementation including: interpretive trail design and construction, revegetation, and irrigation design and controls.

Northwest Associates, Inc. is the culmination of a long progression of successful water related construction business ventures by the company principals over the last 20 years. Northwest Associates was organized in 1997 by its principals, each with a long-term commitment and involvement in the water industry, including the design, construction, operation and maintenance of numerous water power, water diversion and delivery, and watershed environmental mitigation and enhancement projects.

FIGURE 1

214-214-9719



COMPUTER DRAFTED

DESIGN CRITERIA

GENERAL:
1. LOCATED IN-STREAM ON BOTTOM.
2. FLOATABLE (SEE RETRIEVAL CRITERIA BELOW).
3. UNDERWATER WEIGHT IS ADJUSTABLE WITH BUOYANCY WHILE SINKING.
4. SCREEN IS STAINLESS WEDGE WIRE WITH MAX. OPENING TO SUIT LOCAL AGENCIES.
5. SCREEN CLEANING IS BY PNEUMATICS (SEE SCREEN CLEANING CRITERIA BELOW).
6. CONSTRUCTED OF CORROSION RESISTANT MATERIALS i.e. STAINLESS STEEL, PVC, FIBERGLASS.
7. MUST BE ECONOMICAL AND ABLE TO USE MASS PRODUCTION TECHNIQUES.
8. UNIT IS TRANSPORTABLE BY TRUCK OR RAILROAD.

FLOW:
1. SWEEPING VELOCITY ≥ 1 FT/SEC.
2. VELOCITY PERPENDICULAR TO FACE ≤ 0.33 FT/SEC. (MEASURED OVER ANY SQUARE FOOT OF SCREEN SURFACE).
3. DISCHARGE PIPE VELOCITY ≤ 8 FT/SEC.
4. FLOW RATE = 25 CUBIC FT/SEC. SMALL UNIT. FLOW RATE = 100 CUBIC FT/SEC. LARGE UNIT.
5. MINIMUM STREAM VELOCITY TO MOVE UNIT = 10 FT/SEC.

AIR SCREEN CLEANING CRITERIA:
1. WEDGE WIRES IN SCREENS SHALL BE ORIENTED PERPENDICULAR TO STREAM FLOW.
2. AIR PRESSURE 100 TO 120 POUNDS PER SQUARE INCH (GAUGE).
3. AIR PIPING SPACING = 2 FT. APART.
4. HOLES IN AIR PIPES SHALL BE LOCATED SO THAT ENTIRE SCREEN IS CLEANED BY JETTING ACTION OF AIR BLASTS.
5. AIR BLAST DURATION = 3-4 SECONDS (ADJUSTABLE).
6. ONLY ONE COMPARTMENT OF THE SCREEN SHALL BE CLEANED AT A TIME.
7. COMPARTMENTS SHALL BE CLEANED SEQUENTIALLY FROM UPSTREAM TO DOWNSTREAM APPROX. 10-60 SEC. APART.
8. CLEANING SYSTEM SHALL BE FULLY PNEUMATIC (NO ELECTRICAL SHALL BE USED IN THE UNIT).
9. AIR COMPRESSOR & MAIN AIR TANK SHALL BE LOCATED ON SHORE CONNECTED TO UNIT BY ONLY ONE AIR CLEANING HOSE.
10. AIR CLEANING PROCESS SHALL BE FULLY AUTOMATIC WHEN UNIT PNEUMATIC SYSTEM BECOMES PRESSURIZED.
11. AIR SCREEN CLEANING SYSTEM SHALL REMOVE ALL ALGAE, PINE NEEDLES, LEAVES, AQUATIC GRASSES, SAND AND GRAVEL UP TO 1" DIAMETER.

PLACEMENT AND RETRIEVAL CRITERIA:
1. UNIT SHALL BE FLOATABLE, SINKABLE UNDER CONTROL AND RETRIEVABLE BY BUOYANCY, WITHOUT DIVERS, FROM THE WATER SURFACE AND / OR SHORE.
2. UNIT SHALL BE MADE TO BE NEUTRALLY BUOYANT DURING SINKING PROCESS.
3. RETRIEVAL SHALL BE POSSIBLE BY PRESSURIZING BUOYANCY CHAMBERS WITH A SINGLE AIR HOSE FROM SHORE.
4. POSITION SHALL BE MAINTAINED BY POSITIVE ANCHORAGE TO SHORE AND OR RIVER BOTTOM.
5. RETRIEVAL SHALL BE POSSIBLE IN LESS THEN 30 MINUTES; PLACEMENT SHALL BE POSSIBLE IN LESS THAN 1 HOUR.
6. UNIT SHALL REMAIN WITHIN 10° OF HORIZONTAL UNDER ALL PLACEMENT & RETRIEVAL CONDITIONS.

DISCHARGE PIPING:
1. PIPING SHALL BE WEIGHTED TO RESIST MOVEMENT IN UP TO 10 FT/SEC. RIVER VELOCITY.
2. ALL PIPE CONNECTIONS SHALL BE OF A SLIP-JOINT DESIGN WHICH DOES NOT REQUIRE DIVERS TO ASSEMBLE.
3. PIPE LEAKAGE SHALL NOT CAUSE HARM TO FISH.
4. PIPE SHALL DISCHARGE INTO A PUMP FOREBAY WHICH IS ISOLATED FROM THE RIVER.

Propriatary

Information

Patent No. 5,558,462

ALWAYS THINK SAFETY

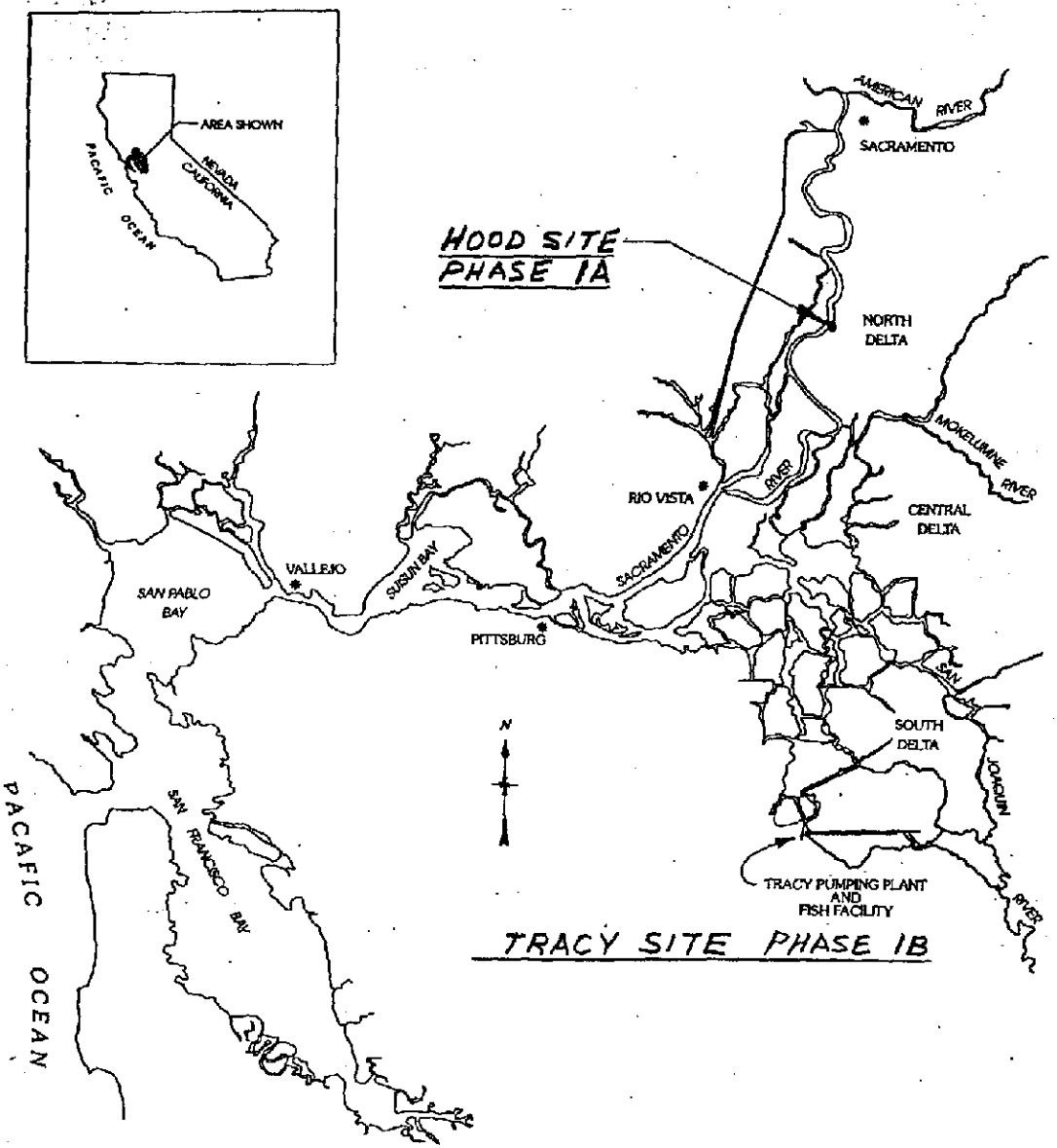
U S B R

(UNIVERSAL STREAM-BOTTOM RETRIEVABLE)

FLAT PLATE FISH SCREEN

214-214-9719-A

FIGURE 2



Sacramento - San Joaquin Estuary

Figure 1.
Map of the Sacramento - San Joaquin Delta showing the location of the Tracy Fish Collection Facility

I-008395

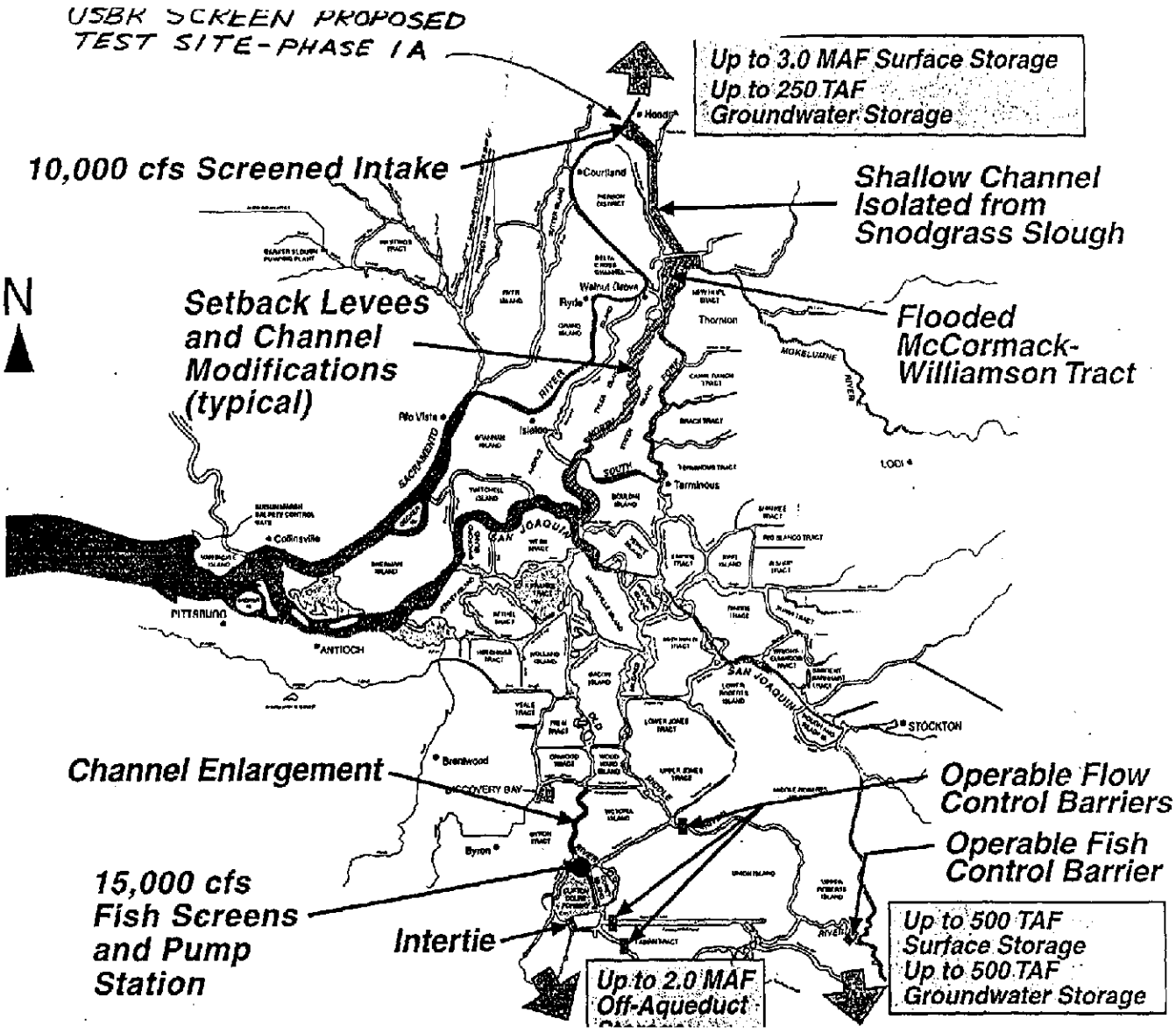


FIGURE 3

I-008396

FIGURE 4

Tracy Fish Collection Facility Studies

Figure 1. Diagram of the Tracy Fish Facility showing the location of tthe continuous sampling device behind the trash rack

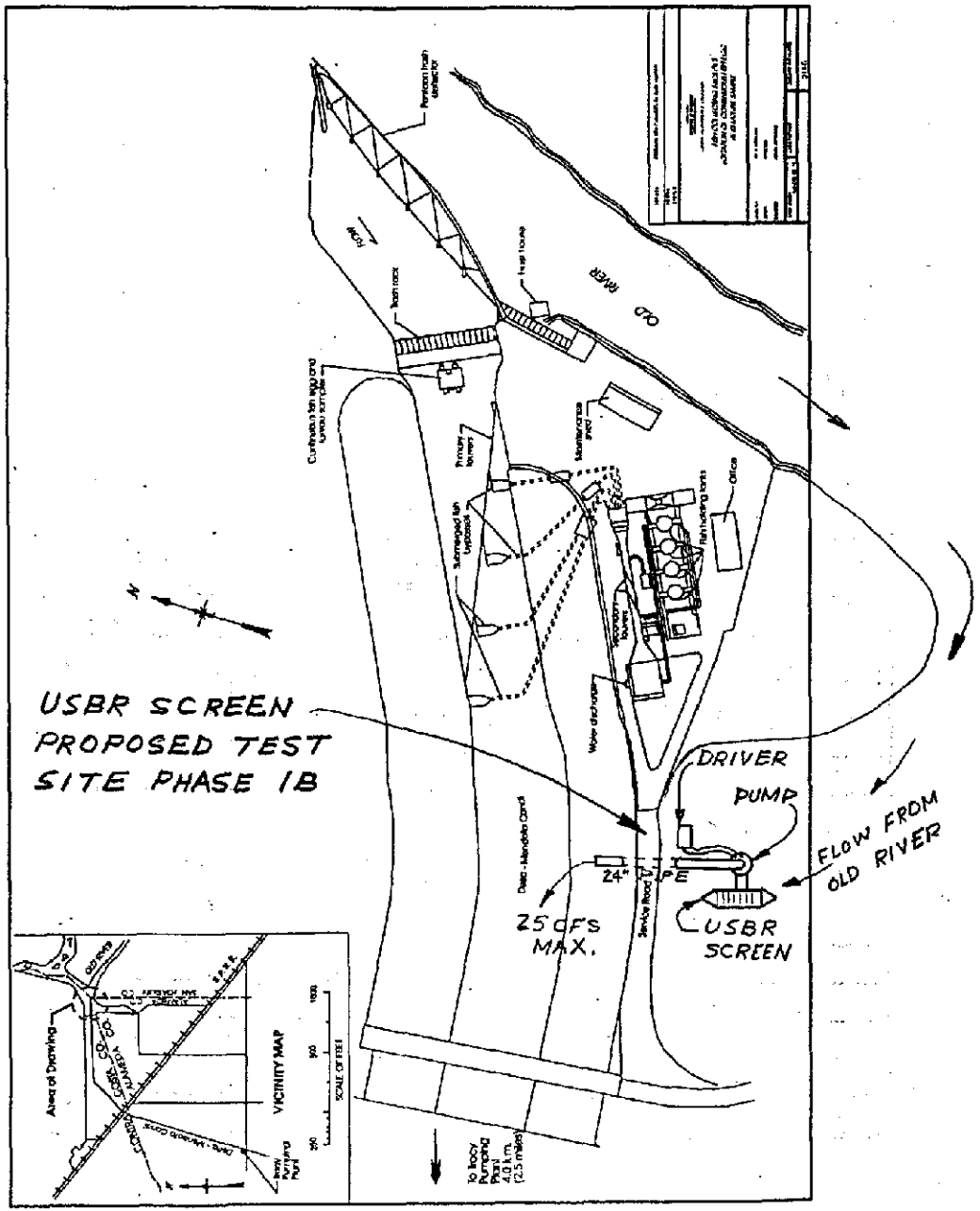


FIGURE 5

ANTICIPATED PERMITS AND DOCUMENTATION REQUIRED TO DO TESTING -

A Categorical Exclusion Checklist (CEC) will be completed under Bureau of Reclamation (BOR) National Environmental Protection Act (NEPA) compliance procedures. In addition, permits will be obtained to do the screen site demonstrations and testing under the following laws and regulations:

1. Section 10, Rivers and Harbors Act of 1899 (Corps of Engineers). A permit is required whenever any obstruction is built in a navigable water or the condition or capacity of a channel is altered or modified.

2. Section 404, Clean Water Act (Corps of Engineers). A permit is required for any dredge or fill operation in a navigable water or wetland.

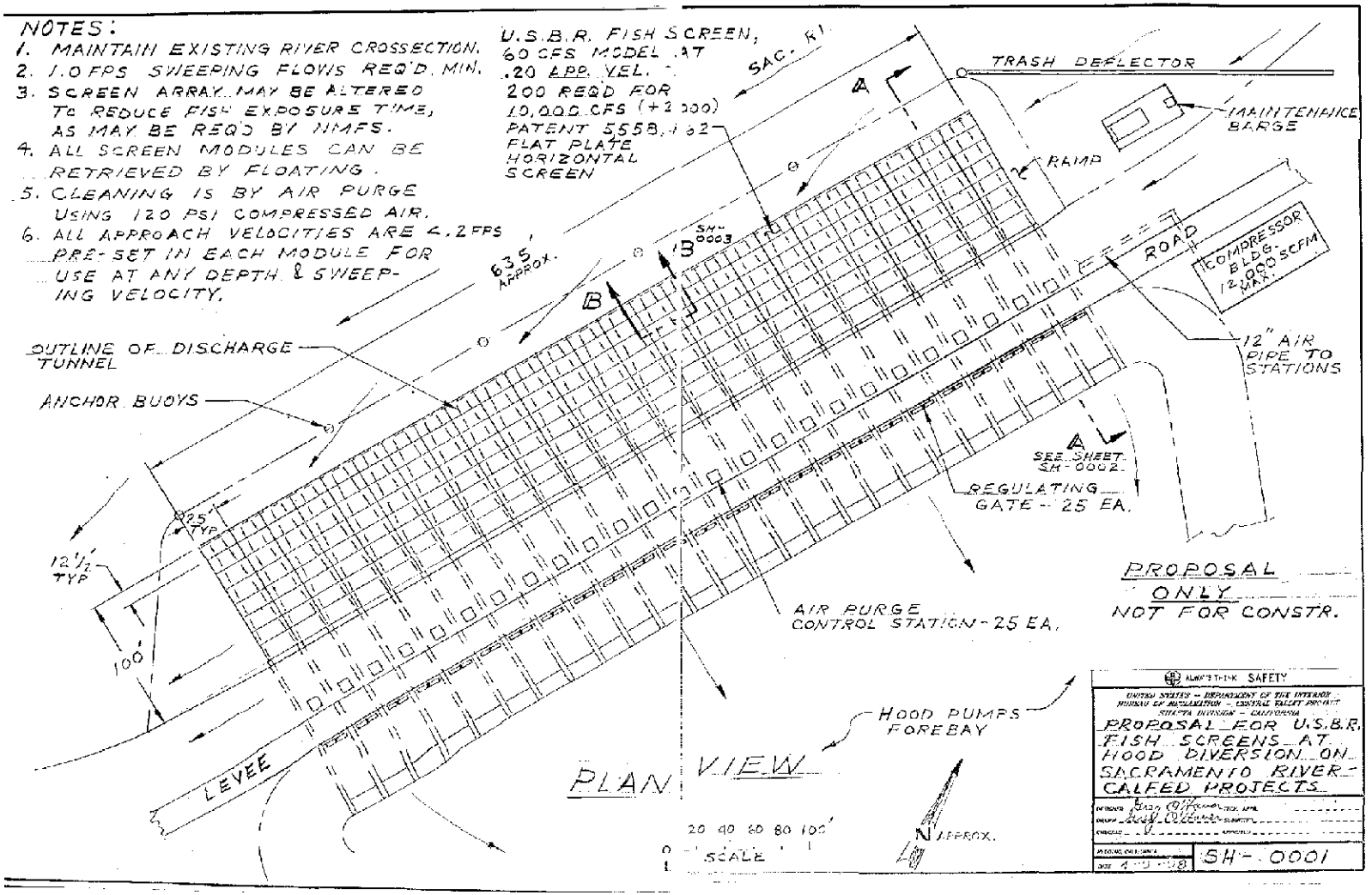
3. Section 401, Clean Water Act (Regional Water Quality Control Board). A permit or a waiver is required from the Regional Water Quality Control Board if the Corps issues a permit.

4. Section 1601, California Fish and Game Code (California Department of Fish and Game). Activities that will substantially obstruct or divert the natural flow, or substantially change the river bed, require a Stream or Lake Alteration Agreement.

5. Endangered Species Act, Section 7. (National Marine Fisheries Service; Fish and Wildlife Service). Concurrence would be required from NMFS that the project would not adversely affect the endangered winter-run Chinook salmon and concurrence with respect to the spring-run and the steelhead which are under consideration for listing would also be appropriate. Consultation with the Fish and Wildlife Service would also be required to ensure no listed species or other anadromous fishes would be affected, but this is not expected to be the case.

6. Fish and Wildlife Coordination Act, (Fish and Wildlife Service). Consultation with the Service is required for activities in fresh waters.

7. Coast Guard permits for buoy placement, vessel operation, or other matters may be required. The Coast Guard will be consulted concerning their requirements.



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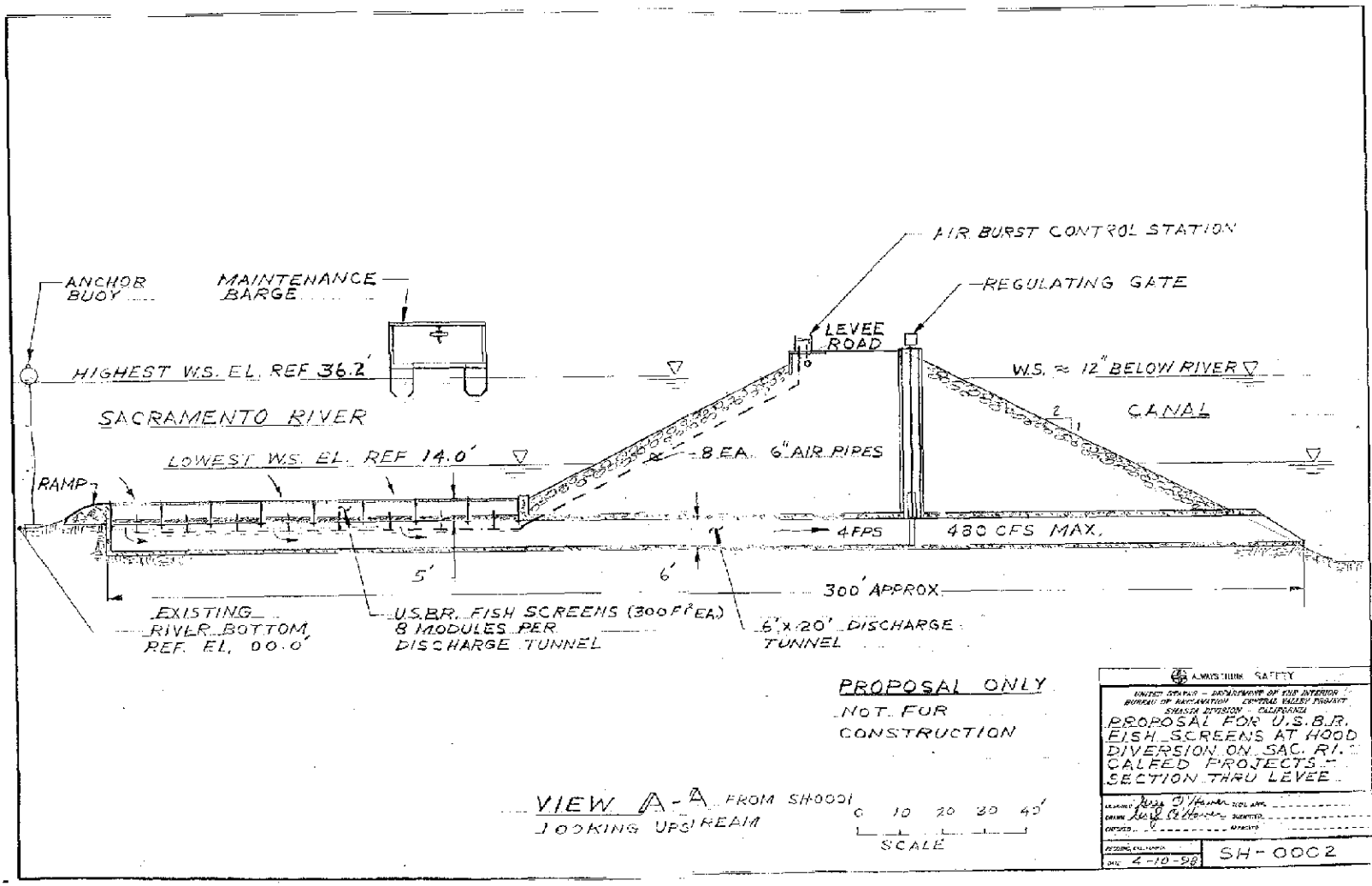
I-0008399



PROPOSAL ONLY
NOT FOR CONSTRUCTION

VIEW A-A FROM SH 0001
LOOKING UPSTREAM

0 10 20 30 45'
SCALE

ARMY-NAVY SAFETY

UNITED STATES – DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION – CENTRAL VALLEY PROJECT
SHASTA DIVISION – CALIFORNIA

PROPOSAL FOR U.S.B.R. FISH SCREENS AT HOOD DIVERSION ON SAC. RI. CALFED PROJECTS – SECTION THRU LEVEE

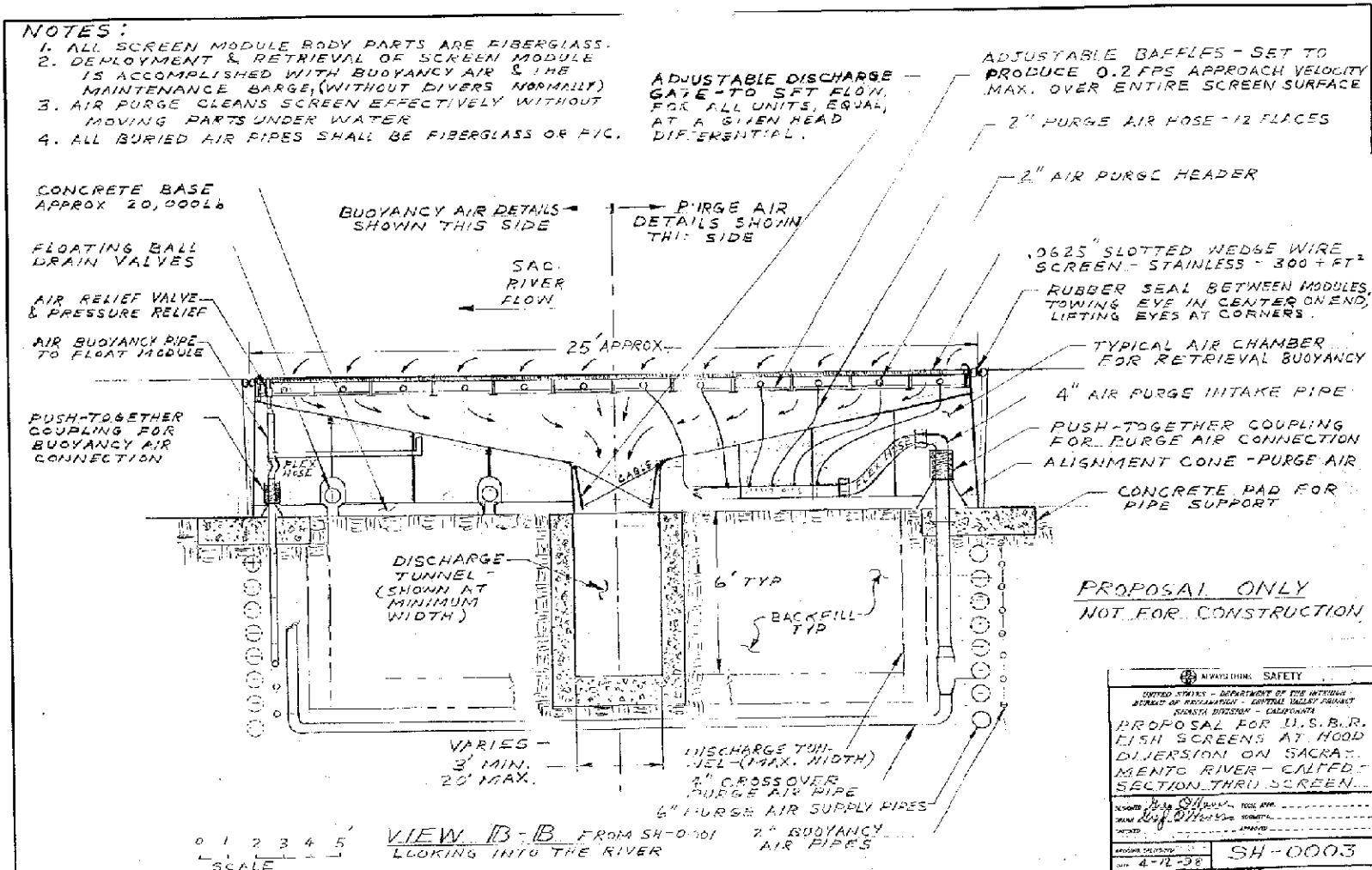
DESIGNED Jess D. Palmer
DRAWN Lucy A. Hoover
CHECKED
TRACED
SUBMITTED
APPROVED
DATE 4-10-98

SH-0002

I—008400

I-008400

NOTES:
1. ALL SCREEN MODULE BODY PARTS ARE FIBERGLASS.
2. DEPLOYMENT & RETRIEVAL OF SCREEN MODULE IS ACCOMPLISHED WITH BUOYANCY AIR & THE MAINTENANCE BARGE, (WITHOUT DIVERS NORMALLY)
3. AIR PURGE CLEANS SCREEN EFFECTIVELY WITHOUT MOVING PARTS UNDER WATER
4. ALL BURIED AIR PIPES SHALL BE FIBERGLASS OR P/C.



VIEW B-B FROM SH-0001 LOOKING INTO THE RIVER

PROPOSAL ONLY
NOT FOR CONSTRUCTION

ALWAYS THINK SAFETY

UNITED STATES - DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION - CENTRAL VALLEY PROJECT
SHASTA DIVISION - CALIFORNIA

PROPOSAL FOR U.S.B.R. FISH SCREENS AT HOOD DIVERSION ON SACRAMENTO RIVER - CALIFED - SECTION THRU SCREEN

DESIGNED [illegible] TRACED [illegible]
DRAWN [illegible] CHECKED [illegible]
QUANTITIES [illegible] APPROVED [illegible]
RECOMMENDED [illegible]
DATE 4-12-98

SH-0003

I-008401

I-008401

U.S. Department of the Interior

Certifications Regarding Debarment, Suspension and Other Responsibility Matters, Drug-Free Workplace Requirements and Lobbying

Persons signing this form should refer to the regulations referenced below for complete instructions:

Certification Regarding Debarment, Suspension, and Other Responsibility Matters - Primary Covered Transactions - The prospective primary participant further agrees by submitting this proposal that it will include the clause titled, "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transaction," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions. See below for language to be used or use this form for certification and sign. (See Appendix A of Subpart D of 43 CFR Part 12.)

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transactions - (See Appendix B of Subpart D of 43 CFR Part 12.)

Certification Regarding Drug-Free Workplace Requirements - Alternate I. (Grantees Other Than Individuals) and Alternate II. (Grantees Who are Individuals) - (See Appendix C of Subpart D of 43 CFR Part 12)

Signature on this form provides for compliance with certification requirements under 43 CFR Parts 12 and 18. The certifications shall be treated as a material representation of fact upon which reliance will be placed when the Department of the Interior determines to award the covered transaction, grant, cooperative agreement or loan.

PART A: Certification Regarding Debarment, Suspension, and Other Responsibility Matters - Primary Covered Transactions

---

CHECK ✓ IF THIS CERTIFICATION IS FOR A PRIMARY COVERED TRANSACTION AND IS APPLICABLE

(1) The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

(a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded by any Federal department or agency;

(b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and

(d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

(2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

PART B: Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transactions

---

CHECK ✓ IF THIS CERTIFICATION IS FOR A LOWER TIER COVERED TRANSACTION AND IS APPLICABLE.

(1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

(2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

DI-2010
June 1985
(TN's form replaces DI-1953, DI-1954, DI-1955, DI-1960 and DI-1962)

PART C: Certification Regarding Drug-Free Workplace Requirements

CHECK__IF THIS CERTIFICATION IS FOR AN APPLICANT WHO IS NOT AN INDIVIDUAL.

Alternate I. (Grantees Other Than Individuals)

A. The grantee certifies that it will or continue to provide a drug-free workplace by:

(a) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition;

(b) Establishing an ongoing drug-free awareness program to inform employees about—
(1) The dangers of drug abuse in the workplace;
(2) The grantee's policy of maintaining a drug-free workplace;
(3) Any available drug counseling, rehabilitation, and employee assistance programs; and
(4) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace;

(c) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (a);

(d) Notifying the employee in the statement required by paragraph (a) that, as a condition of employment under the grant, the employee will —
(1) Abide by the terms of the statement; and
(2) Notify the employer in writing of his or her conviction for a violation of a criminal drug statute occurring in the workplace no later than five calendar days after such conviction;

(e) Notifying the agency in writing, within ten calendar days after receiving notice under subparagraph (d)(2) from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position title, to every grant officer on whose grant activity the convicted employee was working, unless the Federal agency has designated a central point for the receipt of such notices. Notice shall include the identification number(s) of each affected grant;

(f) Taking one of the following actions, within 30 calendar days of receiving notice under subparagraph (d)(2), with respect to any employee who is so convicted —
(1) Taking appropriate personnel action against such an employee, up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended; or
(2) Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency;

(g) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs (a) (b), (c), (d), (e) and (f).

B. The grantee may insert in the space provided below the site(s for the performance of work done in connection with the specific grant:

Place of Performance (Street address, city, county, state, zip code)

_____

_____

_____

Check___If there are workplaces on file that are not identified here.

PART D: Certification Regarding Drug-Free Workplace Requirements

CHECK ✓ IF THIS CERTIFICATION IS FOR AN APPLICANT WHO IS AN INDIVIDUAL.

Alternate II. (Grantees Who Are Individuals)

(a) The grantee certifies that, as a condition of the grant, he or she will not engage in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance in conducting any activity with the grant;

(b) If convicted of a criminal drug offense resulting from a violation occurring during the conduct of any grant activity, he or she will report the conviction, in writing, within 10 calendar days of the conviction, to the grant officer or other designee, unless the Federal agency designates a central point for the receipt of such notices. When notice is made to such a central point, it shall include the identification number(s) of each affected grant.

DI-2010
June 1988
(This form replaces DI-1953, DI-1954, DI-1955, DI-1958 and DI-1963)

PART E: Certification Regarding Lobbying
Certification for Contracts, Grants, Loans, and Cooperative Agreements

CHECK ✓ IF CERTIFICATION IS FOR THE AWARD OF ANY OF THE FOLLOWING AND THE AMOUNT EXCEEDS $100,000: A FEDERAL GRANT OR COOPERATIVE AGREEMENT; SUBCONTRACT, OR SUBGRANT UNDER THE GRANT OR COOPERATIVE AGREEMENT.

CHECK __ IF CERTIFICATION IS FOR THE AWARD OF A FEDERAL LOAN EXCEEDING THE AMOUNT OF $150,000, OR A SUBGRANT OR SUBCONTRACT EXCEEDING $100,000, UNDER THE LOAN.

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, and officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

As the authorized certifying official, I hereby certify that the above specified certifications are true.

Greg O'Haver P.E. & PROGRAM MANAGER

Vice President of NorthWest Associates Inc.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL

Greg O'Haver, Mechanical Engineer & Program Manager

TYPED NAME AND TITLE

DATE 6-29-98

DI-2010
June 1988
(This form replaces DI-1953, DI-1954, DI-1955, DI-1956 and DI-1963)

Figure 1

Standard Form 424

APPLICATION FOR FEDERAL ASSISTANCE

OMB Approval No. 0348-0043

1. TYPE OF SUBMISSION: Application / Preapplication; ☒ Construction / ☐ Construction; ☐ Non-Construction / ☐ Non-Construction	2. DATE SUBMITTED: 7/2/98	Applicant Identifier: N/A
	3. DATE RECEIVED BY STATE: N/A	State Application Identifier: N/A
	4. DATE RECEIVED BY FEDERAL AGENCY:	Federal Identifier:

5. APPLICANT INFORMATION

Legal Name: George Gregory O'Haver

Organizational Unit: Bureau of Reclamation

Address (give city, county, state, and zip code):
Shasta Lake City
Shasta County
California 96019

Name and telephone number of person to be contacted on matters involving this application (give area code):
Greg O'Haver
(530) 275-1554 Ext. 213

6. EMPLOYER IDENTIFICATION NUMBER (EIN): 84-1024566

7. TYPE OF APPLICANT: (enter appropriate letter in box) L

A. State
B. County
C. Municipal
D. Township
E. Interstate
F. Intermunicipal
G. Special District
H. Independent School Dist.
I. State Controlled Institution of Higher Learning
J. Private University
K. Indian Tribe
L. Individual
M. Profit Organization
N. Other (Specify) _____

8. TYPE OF APPLICATION:
☒ New ☐ Continuation ☐ Revision

If Revision, enter appropriate letter(s) in box(es): ☐ ☐

A. Increase Award B. Decrease Award C. Increase Duration
D. Decrease Duration Other (specify):

9. NAME OF FEDERAL AGENCY:
CALFED - CVPIA Funds or Equal

10. CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER: ☐☐ - ☐☐☐

TITLE: N/A

11. DESCRIPTIVE TITLE OF APPLICANT'S PROJECT:
Development & Installation of USBR 100 cfs Fish Screen (See Attached CALFED Application)

12. AREAS AFFECTED BY PROJECT (Cities, Counties, States, etc.):
State of California
(Bay-Delta CALFED Projects)

13. PROPOSED PROJECT

14. CONGRESSIONAL DISTRICTS OF:

Start Date	Ending Date	a. Applicant	b. Project
12/1/98	5/1/2000	Redding, 2nd District	Red Bluff 3rd, Tracy 11th

15. ESTIMATED FUNDING:

a. Federal	$ 473,700.00
b. Applicant NCAO BOR	$ 123,200.00
c. State	$ .00
d. Local Private Water Dist.	$ 133,800.00
e. Other Private Corp. & Agencies	$ 317,700.00
f. Program Income	$ .00
g. TOTAL	$ 1,048,400.00

16. IS APPLICATION SUBJECT TO REVIEW BY STATE EXECUTIVE ORDER 12372 PROCESS?

a. YES. THIS PREAPPLICATION/APPLICATION WAS MADE AVAILABLE TO THE STATE EXECUTIVE ORDER 12372 PROCESS FOR REVIEW ON:
DATE 7-2-98

b. NO. ☐ PROGRAM IS NOT COVERED BY E.O. 12372
☐ OR PROGRAM HAS NOT BEEN SELECTED BY STATE FOR REVIEW

17. IS THE APPLICANT DELINQUENT ON ANY FEDERAL DEBT?
☐ Yes If "Yes," attach an explanation. ☒ No

18. TO THE BEST OF MY KNOWLEDGE AND BELIEF, ALL DATA IN THIS APPLICATION/PREAPPLICATION ARE TRUE AND CORRECT, THE DOCUMENT HAS BEEN DULY AUTHORIZED BY THE GOVERNING BODY OF THE APPLICANT AND THE APPLICANT WILL COMPLY WITH THE ATTACHED ASSURANCES IF THE ASSISTANCE IS AWARDED.

a. Type Name of Authorized Representative	b. Title	c. Telephone Number
George Gregory O'Haver	Professional Mechanical Eng.	(530) 275-1554
d. Signature of Authorized Representative		e. Date Signed: 6/30/98

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Standard Form 424 (REV. 4-92)
Prescribed by OMB Circular A-102

I —008405

I-008405

Figure 4

Standard Form 424C

BUDGET INFORMATION — Construction Programs

OMB Approval No. 0348-0041

NOTE: Certain Federal assistance programs require additional computations to arrive at the Federal share of project costs eligible for participation. If such is the case you will be notified.

	COST CLASSIFICATION	a. Total Cost	b. Costs Not Allowable for Participation	c. Total Allowable Costs (Column a-b)
1.	Administrative and legal expenses	$ 53,300.00	$ ZERO .00	$ 53,300.00
2.	Land, structures, rights-of-way, appraisals, etc.	$ .00	$ " .00	$ .00
3.	Relocation expenses and payments	$ .00	$ " .00	$ .00
4.	Architectural and engineering fees	$ 57,100.00	$ " .00	$ 57,100.00
5.	Other architectural and engineering fees	$ .00	$ " .00	$ .00
6.	Project inspection fees	$ 19,100.00	$ " .00	$ 19,100.00
7.	Site work	$ .00	$ " .00	$ .00
8.	Demolition and removal	$ .00	$ " .00	$ .00
9.	Construction	$ 913,900.00	$ " .00	$ 913,900.00
10.	Equipment	$ .00	$ " .00	$ .00
11.	Miscellaneous	$ 5,000.00	$ " .00	$ 5,000.00
12.	SUBTOTAL (sum of lines 1-11)	$ 1,048,400.00	$ " .00	$ 1,048,400.00
13.	Contingencies	$ N/A .00	$ " .00	$ .00
14.	SUBTOTAL	$ 1,048,400.00	$ " .00	$ 1,048,400.00
15.	Project (program) income	$ .00	$ " .00	$ .00
16.	TOTAL PROJECT COSTS (subtract #15 from #14)	$ 1,048,400.00	$ " .00	$ 1,048,400.00
	FEDERAL FUNDING			
17.	Federal assistance requested, calculate as follows: (Consult Federal agency for Federal percentage share). Enter the resulting Federal share.	Enter eligible costs from line 16c Multiply X 50 % MAXIMUM		$ 524,200.00

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Standard Form 424C (Rev. 4-92)
Prescribed by OMB Circular A-102

I—008406

I-008406

Figure 5

Standard Form 424D

OMB Approval No. 0348-0042

ASSURANCES — CONSTRUCTION PROGRAMS

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0042), Washington, DC 20503

PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET, SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.

NOTE: Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the Awarding Agency. Further, certain Federal assistance awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant I certify that the applicant:

1. Has the legal authority to apply for Federal assistance, and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project costs) to ensure proper planning, management and completion of the project described in this application.

2. Will give the awarding agency, the Comptroller General of the United States, and if appropriate, the State, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the assistance; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.

3. Will not dispose of, modify the use of, or change the terms of the real property title, or other interest in the site and facilities without permission and instructions from the awarding agency. Will record the Federal interest in the title of real property in accordance with awarding agency directives and will include a covenant in the title of real property acquired in whole or in part with Federal assistance funds to assure non-discrimination during the useful life of the project.

4. Will comply with the requirements of the assistance awarding agency with regard to the drafting, review and approval of construction plans and specifications.

5. Will provide and maintain competent and adequate engineering supervision at the construction site to ensure that the complete work conforms with the approved plans and specifications and will furnish progress reports and such other information as may be required by the assistance awarding agency or State.

6. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.

7. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.

8. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§ 4728-4763) relating to prescribed standards for merit systems for programs funded under one of the nineteen statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).

9. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§ 4801 et seq.) which prohibits the use of lead based paint in construction or rehabilitation of residence structures.

10. Will comply with all Federal statues relating to non-discrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§ 1681-1683, and 1685-1686) which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. § 794) which prohibits discrimination of the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. §§ 6101-6107) which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 93-255), as amended, relating to non-discrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§ 523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. 290 dd-3 and 290 ee-3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. § 3601 et seq.), as amended, relating to non-discrimination in the sale, rental or financing of housing; (i) any other non-discrimination provisions in the specific statute(s) under which application for Federal assistance is being made, and (j) the requirements on any other non-discrimination Statute(s) which may apply to the application.

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Standard Form 424D (Rev. 4/92)
Prescribed by OMB Circular A-102

I-008407

Figure 5

Standard Form 424D (cont'd.)

11. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provides for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal and federally assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.

12. Will comply with the provisions of the Hatch Act (5 U.S.C. §§ 1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

13. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§ 276a to 276a-7), the Copeland Act (40 U.S.C. § 276c and 18 U.S.C. § 874), the Contract Work Hours and Safety Standards Act (40 U.S.C. §§ 327-333) regarding labor standards for federally assisted construction subagreements.

14. Will comply with the flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is $10,000 or more.

15. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. § § 7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended, (P.L. 93-523); and (h) protection of endangered species under the Endangered Species Act of 1973, as amended, (P.L. 93-205).

16. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§ 1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.

17. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. § § 470), EO 11593 (identification and preservation of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U. S.C.§ § 469a-1 et seq.).

18. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act of 1984.

19. Will comply with all applicable requirements of all other Federal laws, Executive Orders, regulations and policies governing this program.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL	TITLE
George Gregory O'Haver	MECHANICAL ENGINEER
APPLICANT ORGANIZATION	DATE SUBMITTED
U. S. BUREAU OF RECLAMATION	7 - 2 - 98

SF 424D (Rev. 4/92) Back

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